Continuous sustainability improvement

PET cap & closure applications

As government regulations and market demands push for improved sustainability and circular economy initiatives, brand owners and packaging producers look for solutions that avoid compromising quality or efficiency. One of the latest initiatives to gain traction is the idea of matching container and closure material to simplify downstream recycling efforts in support of the circular economy. This means transitioning closure material from HDPE to PET

Customer-driven objectives

Mold-Masters key objective is to support customers in their transition toward more sustainable packaging solutions. The company says that it has proven that closures can be produced with the same level of process stability, quality, and productivity expected from conventional materials - while offering clear sustainability benefits.

PET material is more shear sensitive than conventional materials so Mold-Masters recommends using a high-performance valve gated hot runner system. Valve gated systems provide a wider safety margin and more predictable production environment often resulting in lower total cost of ownership despite higher initial investment.

However, implementation of recycled materials has become a critical differentiator. To address these requirements, Mold-Masters validated the production of rPET closures, demonstrating how technology enables reliable, future-ready manufacturing.

Challenges of processing rPET

As PCR is a blend of material coming from a variety of sources, the quality of the material can be inconsistent. Therefore, processing parameters can vary significantly from batch to batch. This can limit their suitability for certain applications and make moulders hesitant to use them. rPET demands more precise thermal and flow control than virgin material so process discipline becomes critical.

Mold-Masters hot runner systems incorporate processing technologies that make them particularly well suited for processing such materials. Key considerations include precise thermal and flow control, the minimisation of dead spots and residence time, as well as uniform gating and balanced flow. In addition, valve gate designs with precise timing are employed when a high level of cosmetic quality is required.

Reliable performance with PET/rPET

Mold-Masters stated that through optimised tooling design, controlled process parameters and appropriate monitoring, stable production can be maintained while preserving dimensional and functional quality. This supports repeatable production performance, reduces risk during material transitions, and helps ensure consistent product quality across production runs.

A partnership approach

The success of any project is driven by close collaboration between all stakeholders. Mold-Masters acts as a technology partner, supporting customers not only with hardware, but also with process expertise, application knowledge, and a long-term perspective on scalability and optimisation.

Scalable and future-ready

The findings demonstrate that the approach is suitable for further optimisation and scale-up, supporting the transition from pilot-scale trials to industrial production. Although the example shown relates to a 37 mm closure, the underlying technical concept is applicable to caps and closures across a wide range of sizes.

Overall, Mold-Masters demonstrates that sustainable PET/rPET closures can be produced reliably when the right technology and the right partner are in place. With its high-performance hot runner platform and customer-centric approach, Mold-Masters aims to enable packaging producers to meet sustainability demands while securing long-term production performance and investment protection

www.moldmasters.com

About Mold-Masters

Mold-Masters is a global supplier of hot runners, controllers, auxiliary injection and co-injection systems. The company designs, manufactures, distributes, sells and services highly engineered and customised plastic processing equipment. Mold-Masters is credited for patenting the first commercially viable hot runner system in 1965. Today, Mold-Masters conducts business in more than 100 countries and employs a diverse workforce that exceeds 2,150 professionals. Mold-Masters Global Headquarters is located in Georgetown, ON Canada. Mold-Masters is an operating company of Hillenbrand (NYSE: HI).